



Government  
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# Severe Storms

## What to do?



Canada

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PREPARED?

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This publication was produced by Public Safety Canada in collaboration with: The Canadian Red Cross, Environment Canada, Natural Resources Canada, and St. John Ambulance.

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# INTRODUCTION

*Thunderstorms, hail, blizzards, ice storms, hurricanes, storm surges, tornadoes and heavy rain can develop quickly and threaten life and property. These severe storms occur in all regions of Canada and in all seasons.*

When one strikes, visit Environment Canada's Weather office website and listen to the local media for severe weather warnings and advice. Keep a battery-powered or crank radio on hand as power outages can be frequent during severe storms. Everyone has a responsibility to protect their homes and their families.

You can greatly lessen the impact of a severe storm by taking the time to prepare in advance. This involves three basic steps:

1. Find out about the **risks** and the type of storms in your region.
2. Make a family emergency **plan**, so that everyone knows what to do, and where to go in case of an emergency.
3. Get an emergency **kit**, so that you and your family can be self-sufficient for at least 72 hours during a severe storm.

Planning for a storm will also help prepare you for many other types of emergencies. After reading this guide, keep it in a handy spot, such as in your emergency kit.

# STEP 1: KNOW THE RISKS AND GET PREPARED

*To get prepared for a storm, you should know the risks specific to your community and your region to help you better prepare. To find out what the hazards are in your region, visit the “Know the risks” section of the [GetPrepared.ca](http://GetPrepared.ca) website.*



## Preparing for Severe Storms

### Before

- Trim dead branches and cut down dead trees to reduce the danger of these falling onto your house during a storm.
- Clean gutters, drains and downpipes.
- Make sure your roof is in good repair.
- Prepare an emergency kit.

### When a storm is imminent

- When a severe storm is on the horizon, Environment Canada will issue weather warnings through the Weatheroffice website, automated telephone information lines and its “Weatheradio” service. Radio and television stations will also broadcast Environment Canada weather statements. Pay attention to that information.
- Always check the weather forecast before heading out on the water. Do not go boating in a storm. If you are on the water and see bad weather approaching, head for shore immediately.

Remember to file a sail plan with a responsible person, and frequently monitor the VHF marine or Weatheradio broadcast throughout your trip.

- Secure everything that might be blown around or torn loose — indoors and outdoors. Flying objects such as garbage cans and lawn furniture can injure people and damage property.
- Consider going to the sheltered area that you and your family identified in your emergency plan.

### During a storm

- If you are indoors during a storm, stay away from windows, doors and fireplaces.
- If you are advised by officials to evacuate, do so. Delay may make later evacuation difficult or impossible. Take your emergency kit with you.
- If indoors, you can use a cellular or cordless telephone during a severe storm, but it is not safe to use a corded telephone.
- If you are in a car, stop the car away from trees or power lines that might fall on you. Avoid the base of steep or unstable slopes and low areas prone to flooding. Stay inside the car.



## Blizzards and Winter Storms

Blizzards come in on a wave of cold arctic air, bringing snow, bitter cold, high winds and poor visibility due to blowing snow.

- May last anywhere from a few hours to several days.
- Are often accompanied by high winds in the Prairies, Arctic, northern Ontario and northern Quebec.
- Typically bring heavy snowfalls in British Columbia, the Atlantic Provinces, southern and eastern Quebec and areas near the Great Lakes.

- May include a wind chill “warning”, issued when very cold temperatures ( $-35^{\circ}\text{C}$  or colder) combined with wind could create outdoor conditions hazardous to human activity.
- Can give rise to a wind storm warning when winds are expected to reach a steady speed of between 65–75 km/h, or 90–100 km/h in gusts.
- Can leave heavy snowfall that can cause roof failures or collapses.

## What to do

- If a blizzard or heavy blowing snow is forecast, you may want to string a safety line between your house and any other structures or buildings in case you have to go to them during the storm.
- When a winter storm hits, stay indoors. If you must go outside, dress for the weather. Outer clothing should be tightly woven and water-repellent. The jacket should have a hood. Wear mittens — they are warmer than gloves — and a hat, as significant body heat is lost through the head.
- In wide-open areas, visibility is limited during heavy blowing snow or a blizzard. You can easily lose your way.
- If a blizzard strikes, do not try to walk to another building unless there is a rope to guide you or something you can follow.
- If you must travel during a winter storm, do so during the day and let someone know your route and arrival time.
- If your car gets stuck in a blizzard or snowstorm, stay in your car. Allow fresh air in your car by opening the window slightly on the sheltered side — away from the wind. You can run the car engine about 10 minutes every half-hour if the exhaust system is not blocked with snow. Check the exhaust pipe periodically to make sure it is not blocked. Remember: you can’t smell potentially fatal carbon monoxide fumes.



- To keep your hands and feet warm, exercise them periodically. In general, it is a good idea to keep moving to avoid falling asleep. If you do try to shovel the snow from around your car, avoid overexerting yourself.
  - Overexertion in the bitter cold can cause death as a result of hypothermia from sweating or a heart attack.
- If snow is excessive or a roof shows signs of distress, contact a professional who is experienced in safe snow removal procedures. Unsafe procedures may cause personal injury and structural damage.
- Prevent access to areas under roofs where snow could fall.
- If you live on a farm, shelter animals. Generally, if the structure is sound, animals should be placed indoors. Once they are inside, secure all openings to the outside. Water supplies should be checked to ensure they have not frozen.



## Hurricanes

Hurricanes are violent tropical storms. These extreme storms occur when winds revolve around a centre of low pressure. In the centre, called the eye, there is often a calm area of blue sky.

- Occasionally hit eastern Canada, usually between June and November (September is the peak month).
- Are bigger and cause more widespread damage than tornadoes (a very large system can be up to 1,000 kilometres wide).
- Wield very strong winds — of at least 120 kilometres per hour — around the “eye” accompanied by torrential rains.
- Can bring heavy rain and cause significant flooding.
- Can often be tracked several days in advance of landfall.
- Usually move slowly and can batter communities for several hours.

## What to do

- During hurricane season, pay attention to weather forecasts and warnings.
- If you live on the coast or in a low-lying area near the coast, move inland and to higher ground. The high winds create huge waves at sea which can be very damaging when combined with a storm surge (see Storm Surges section).
- Do not go down to the water to watch the storm. Most fatalities during hurricanes occur as a result of being caught in large waves, storm surges or flood waters.
- If the eye of the hurricane passes over, there will be a lull in the wind lasting from several minutes to half an hour. Stay in a safe place. Make emergency repairs only and remember that once the eye has passed, the winds will return from the opposite direction with possibly even greater force.
- Listen for reports from authorities on your crank or battery powered radio.
- On a farm, it may be better to leave livestock unsheltered. During past hurricanes some animals left outside suffered less injury than those in shelters, which were injured by collapsing structures and flying objects that may have been avoided outside.



## Ice Storms

Freezing rain occurs when raindrops fall from a warm layer of air into air that is below freezing and become supercool. When the supercooled droplets strike a surface below 0°C they instantly freeze, forming a layer of ice.

- Freezing rain can occur anywhere in the country, but is particularly common in Ontario, Quebec and the Atlantic provinces.
- Remember that ice, branches or power lines can continue to break and fall for several hours after the end of the precipitation.

### What to do

- Ice from freezing rain accumulates on branches, power lines and buildings. If you must go outside when a significant amount of ice has accumulated, pay attention to branches or wires that could break due to the weight of the ice and fall on you.
- Never approach power lines. A hanging power line could be charged (live) and you could be electrocuted. Stay back at least 10 metres (33 feet) from wires or anything in contact with them.
- When freezing rain is forecast, avoid driving if possible. Even a small amount of freezing rain can make roads extremely slippery. Wait several hours after freezing rain ends so that road maintenance crews have enough time to spread sand or salt on icy roads.
- Rapid onsets of freezing rain combined with strong winds increase the chances for hypothermia. If you live on a farm, move livestock promptly to shelter where feed is available. Forage is often temporarily inaccessible during and immediately after ice storms.



## Storm Surges

A storm surge is an abnormally high coastal water level caused by strong winds and low air pressure during storms.

- Occur on all of Canada's coasts, including those of the Great Lakes.
- Occur with severe storms such as hurricanes, blizzards, and ice storms.
- Can damage buildings, docks, boats and other structures near the shoreline.

### What to do

- Your property may be prone to flooding from storm surges. If so, do not store valuables and emergency equipment in your basement or lower floor. Consider removing exterior doors and windows to your basement and sealing holes and cracks.
- Consider securing small structures such as cottages and mobile homes to a foundation to prevent them from being floated off their footings. If possible, seek shelter in a more secure building.
- Storm surges are predictable and are typically forecast as part of coastal storm warnings. Monitor weather forecasts.
- If flooding is predicted, be prepared to turn off household power and gas. Evacuate when instructed to do so by local authorities.





## Thunderstorms, Lightning and Hail

Thunderstorms are often accompanied by high winds, hail, lightning, heavy rain and in rare cases can produce tornadoes. Hail is formed when updrafts in thunderclouds carry raindrops upward into extremely cold areas of the atmosphere, where they freeze and merge into lumps of ice.

- Thunderstorms and lightning occur throughout Canada but less frequently in the North. On average, 10 people die each year in Canada and up to 160 are injured during such storms.
- Thunderstorms are usually over within an hour, although a series of thunderstorms can last several hours.
- Hailstorms occur across Canada, mostly from May to October. They are most frequent in Alberta, the southern Prairies and in southern Ontario.
- Some hailstones are the size of peas while others can be as big as grapefruits.
- Hail comes down at great speed, especially when accompanied by high winds and can cause serious injuries and damages.

### What to do

- Before a severe thunderstorm, unplug radios, televisions and appliances (especially those that may start up automatically when the power is restored). Listen for weather updates on your wind-up or battery-powered radio.
- If possible, avoid using a corded phone during a thunderstorm. Stay away from items that conduct electricity, such as telephones, appliances, sinks, bathtubs, radiators and metal pipes. These items may conduct electricity.
- Similarly, do not ride bicycles, motorcycles, tractors, golf carts or use metal shovels or golf clubs.
- Do not collect the laundry on the clothesline because it may conduct electricity.

- Take shelter immediately, preferably in a building but, failing this, in a depressed area such as a ditch. Never go under a tree as roots extending from the tree can conduct electricity.
- To estimate how far away the lightning is, count the seconds between the flash of lightning and the thunderclap. Each second represents over 300 metres. If you count fewer than 30 seconds, take shelter.
- Wait 30 minutes after the last lightning strike before venturing outside again.
- Consult our “Power Outages — What to do?” booklet for more information.
- If hail is forecast, protect your vehicle by putting it in the garage or other enclosed space.
- Take cover when hail begins to fall. Do not go out to cover plants, cars or garden furniture.
- When a hailstorm hits, stay indoors, and keep yourself and your pets away from windows, glass doors and skylights which can shatter if hit by hailstones.

## If outdoors

- If you are caught in the open in a severe storm, do not lie flat. Crouch down with your feet close together and your head down (the “leap-frog” position).
- Seek shelter if possible, like a comfort station in campgrounds. A hard top vehicle will provide the next best shelter, but do not touch any metal surfaces during a thunderstorm.
- If shelter is not available, look for low lying areas but stay away from streams in the event of flash flooding.
- The key to severe storms in summer is to minimize your contact with the ground and make yourself a smaller target. This reduces the risk of being electrocuted by a ground charge.



# Tornadoes

Tornadoes are rotating columns of high winds. Canada gets more tornadoes than any other country with the exception of the United States, averaging about 50 tornadoes per year.

- Can move quickly (up to 70 km/hour) and leave a long path of destruction (at other times the tornado can be small with rapidly fluctuating wind speeds).
- Can uproot trees, overturn cars and demolish houses.
- Usually hit in the afternoon and early evening, but have been known to strike at night.
- Are relatively common in Canada, but only in specific regions: Alberta, Manitoba, Saskatchewan, Ontario, Quebec, New Brunswick, and the interior of British Columbia.
- Have a season extending from April to September with peak months in June and July, but can occur at any time of year.

## Warning signs of a potential tornado

- Severe thunderstorms.
- An extremely dark sky, sometimes highlighted by green or yellow clouds.
- A rumbling or a whistling sound caused by flying debris.
- A funnel cloud at the rear base of a thundercloud, often behind a curtain of heavy rain or hail.

## What to do

### In all cases

- Get as close to the ground as possible, protect your head and watch for flying debris.
- Do not chase tornadoes — they are unpredictable and can change course abruptly.
- A tornado is deceptive. It may appear to be standing still but may in fact be moving toward you.

### **In a house**

- Go to the basement or take shelter in a small interior ground floor room such as a bathroom, closet or hallway.
- If you have no basement, protect yourself by taking shelter under a heavy table or desk.
- In all cases, stay away from windows, outside walls and doors.

### **On a farm**

- If your personal safety is not at risk, you may have time to open routes of escape for your livestock. Open the gate, if necessary, and then exit the area in a direction perpendicular to the expected path of the tornado.

### **In a recreational vehicle or mobile home**

- Find shelter elsewhere, preferably in a building with a strong foundation.
- If no shelter is available, crouch down in a ditch away from the mobile home or recreational vehicle. Beware of flooding from downpours and be prepared to move.

### **In a high rise building**

- Take shelter in an inner hallway or room, ideally in the basement or on the ground floor.
- Do not use the elevator.
- Stay away from windows.

### **In a gymnasium, church or auditorium**

- Large buildings with wide-span roofs may collapse if a tornado hits.
- If you are in one of these buildings and cannot leave, take cover under a sturdy structure such as a table or desk.



### **In a vehicle**

- If you spot a tornado in the distance go to the nearest solid shelter.
- If the tornado is close, get out of your car and take cover in a low-lying area, such as a ditch.
- Do not take shelter under an overpass or a bridge. Winds can accelerate under an overpass or a bridge and cause injury or death from flying debris.



## STEP 2: MAKE AN EMERGENCY PLAN

*Every Canadian household needs an emergency plan. It will help you and your family to know what to do in case of an emergency. Remember, your family may not be together when a storm or other emergency occurs.*

Start by discussing what could happen and what you should do at home, at school or at work if a severe storm strikes. To be prepared, make a list of what needs to be done ahead of time. Store important family documents, such as birth certificates, passports, wills, financial documents, insurance policies, etc. in waterproof container(s). Identify an appropriate out-of-town contact that can act as a central point of contact in an emergency.

Write down and exercise your plan with the entire family at least once a year. Make sure everybody has a copy and keeps it close at hand.

For more information on making an emergency plan, call 1 800 O-Canada or visit **[www.GetPrepared.ca](http://www.GetPrepared.ca)** to download or complete an emergency plan online.





## STEP 3: GET AN EMERGENCY KIT

*In an emergency you will need some basic supplies.  
You may need to get by without power or tap water.  
Be prepared to be self-sufficient for at least 72 hours.*

You may have some of the items already, such as a flashlight, battery-operated radio, food and water. The key is to make sure they are organized and easy to find. Would you be able to find your flashlight in the dark?

Make sure your kit is easy to carry. Keep it in a backpack, duffel bag or suitcase with wheels, in an easy-to-reach, accessible place, such as your front hall closet. Make sure everyone in the household knows where the emergency kit is.

### Basic emergency kit

- Water — at least two litres of water per person per day. Include small bottles that can be carried easily in case of an evacuation order.
- Food that won't spoil, such as canned food, energy bars and dried foods (remember to replace food and water once a year).
- Manual can opener.
- Wind-up or battery-powered flashlight (and extra batteries).
- Wind-up or battery-powered radio (and extra batteries).
- First aid kit.
- Special items such as prescription medications, infant formula, equipment for people with disabilities.
- Extra keys to your car and house.



- Some cash in smaller bills, such as \$10 bills and change for payphones.
- A copy of your emergency plan and contact information.

You can purchase a pre-packaged emergency kit from the Canadian Red Cross at [www.redcross.ca](http://www.redcross.ca).

Visit [www.GetPrepared.ca](http://www.GetPrepared.ca) or call 1 800 O-Canada for a list of additional emergency kit items, including a car emergency kit.



# RESOURCES



## National Resources

Public Safety Canada — Other publications:

- Earthquakes — What to do?
- Emergency Preparedness for Farm Animals
- Floods — What to do?
- Power Outages — What to do?
- Your Emergency Preparedness Guide
- Emergency Preparedness Guide for People with Disabilities/  
Special Needs

For more emergency preparedness information or to order brochures, visit **[www.GetPrepared.ca](http://www.GetPrepared.ca)** or follow **@Get\_Prepared** on Twitter.

Canadian Red Cross — **[www.redcross.ca](http://www.redcross.ca)**

Environment Canada — **[www.weatheroffice.gc.ca](http://www.weatheroffice.gc.ca)**

Natural Resources Canada — **[www.nrcan.gc.ca](http://www.nrcan.gc.ca)**

St. John Ambulance — **[www.sja.ca](http://www.sja.ca)**



## Provincial and Territorial Resources

For regional or local information on emergency preparedness, contact your emergency management organization as follows:

### Alberta

Alberta Emergency Management Agency  
Telephone: (780) 422-9000/Toll-free: 310-0000  
[www.aema.alberta.ca](http://www.aema.alberta.ca)

## **British Columbia**

British Columbia Provincial Emergency Program  
Telephone: (250) 952-4913/Emergency toll-free: 1-800-663-3456  
[www.pep.bc.ca](http://www.pep.bc.ca)

## **Manitoba**

Manitoba Emergency Measures Organization  
Telephone: (204) 945-4772/Toll-free: 1-888-267-8298  
[www.manitobaemo.ca](http://www.manitobaemo.ca)

## **New Brunswick**

New Brunswick Emergency Measures Organization  
Telephone: (506) 453-2133/Toll-free 24-Hour line: 1-800-561-4034  
[www.gnb.ca/cnb/emo-omu](http://www.gnb.ca/cnb/emo-omu)

## **Newfoundland and Labrador**

Newfoundland and Labrador Fire and Emergency Services  
Telephone: (709) 729-3703  
[www.ma.gov.nl.ca/ma/fes](http://www.ma.gov.nl.ca/ma/fes)

## **Northwest Territories**

Northwest Territories Emergency Measures Organization  
Telephone: (867) 873-7538/24-Hour line: (867) 920-2303  
[www.maca.gov.nt.ca/emergency\\_management/index.htm](http://www.maca.gov.nt.ca/emergency_management/index.htm)

## **Nova Scotia**

Nova Scotia Emergency Management Office  
Toll-free 24-Hour line: 1-866-424-5620  
[www.gov.ns.ca/emo](http://www.gov.ns.ca/emo)

## **Nunavut**

Nunavut Emergency Management

Telephone: (867) 975-5403/Toll-free 24-Hour line: 1-800-693-1666  
[cgs.gov.nu.ca/en/nunavut-emergency-management](http://cgs.gov.nu.ca/en/nunavut-emergency-management)

## **Ontario**

Emergency Management Ontario

Telephone: (416) 314-3723/Toll-free 24-Hour line: 1-877-314-3723  
[www.ontario.ca/emo](http://www.ontario.ca/emo)

## **Prince Edward Island**

Prince Edward Island Emergency Measures Organization

Telephone: (902) 894-0385/After hours: (902) 892-9365  
[www.peipublicsafety.ca](http://www.peipublicsafety.ca)

## **Quebec**

Quebec — Ministère de la sécurité publique

Telephone (toll-free): 1-866-644-6826

General information (Services Québec): 1-877-644-4545  
[www.securitepublique.gouv.qc.ca](http://www.securitepublique.gouv.qc.ca)

## **Saskatchewan**

Saskatchewan Emergency Management Organization

Telephone: (306) 787-9563

[www.cps.gov.sk.ca/SaskEMO](http://www.cps.gov.sk.ca/SaskEMO)

## **Yukon**

Yukon Emergency Measures Organization

Telephone: (867) 667-5220

Toll-free (within the Yukon): 1-800-661-0408

[www.community.gov.yk.ca/emo](http://www.community.gov.yk.ca/emo)



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